DOCUMENT RESUME

ED 324 004 IR 053 270

AUTHOR Jayatilleke, Raja
TITLE End-User Searching of ERIC Using Dialog-Ondisc: Menu Driven versus Command Version, with Mediated Online Searching Comparisons.
PUB DATE 89
NOTE 36p.
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Bibliographic Databases; Computer Software Evaluation; Information Needs; *Information Retrieval; *Man Machine Systems; *Menu Driven Software; Online Searching; *Optical Data Disks; Questionnaires; User Satisfaction (Information)
IDENTIFIERS DIALOG; ERIC

ABSTRACT

DIALOG Information Services, one of many vendors offering the ERIC database as a CD-ROM product (DIALOG OnDisc ERIC), offers end users a choice of searching using either a menu- or a command-driven mode. The menu-driven EASY MENU is intended to relieve the user from learning search commands, and is said to be easier to learn and remember. The command-driven version provides more flexibility and enables end users to avail themselves of the more complete power of the DIALOG command system. A questionnaire was given to three groups of graduate education students at the College of Staten Island after they had completed ERIC searches--18 students who used the menu mode, 11 who used the command mode, and 20 who requested online searches by an intermediary. The questionnaire recorded their experiences with the search process, the number and quality of records retrieved, and their overall satisfaction with the search. It was found that users of the menu-driven version were frustrated by the cumbersome steps involved and the amount of time required for their searches. Students in a "new" group, who had received instruction in the basics of command searching with emphasis on the proper usage of Boolean terms, registered less confusion with the search process, and spent less time searching and retrieving results from their total output. Four tables, a search request form, and a search evaluation form are appended. (48 references) (SD)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

This document has been reproduced as received from the person or organization originating it.

Minor changes have been made to improve reproduction quality.

Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

ED324004

END-USER SEARCHING OF ERIC USING DIALOG-ONDISC: MENU DRIVEN VERSUS COMMAND VERSION, WITH MEDIATED ONLINE SEARCHING COMPARISONS

BY

RAJA JAYATILLEKE

Database Specialist

College of Staten Island, New York

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Raja Jayatilleke

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

The literature of database searching is abounding if not replete with reports and studies on end-user access to bibliographic databases. The perception has been, and still is that such access is not only highly desirable but ultimately inevitable. Over the past decade, when end-user searching has been monitored, the theme has been proposed that information professionals have an intrinsic responsibility to facilitate and complete this transition--from mediated access to direct end-user access of bibliographic databases. [2,13,21,28] This is due to the fact that it is the general belief on the information scene that before very long end-users will dominate the process of information retrieval and perform their own database searching; and that librarians and information professionals will, accordingly, be displaced from their roles of being active intermediaries. More than ten years later, this still has not effectively come to pass. The consensus currently among those involved in online searching is that database searching will continue to be mediated for many years into the foreseeable future. [14] Despite the increase in the number of end-users now, and the push to have users do their own searching, many information seekers seem to be declining to become directly involved in looking for answers to their informational needs, and prefer to have information professionals do their seeking for them. [1,7,12,14] Users seem somehow constrained to spend their own time, if not even the barest minimum of time, in connection with their needs. [8] It is our experience at the College of Staten Island (CSI) also that users are becoming direct end-users only if sufficiently interested, or if somehow required to do so. [16]

IR053270

A good proportion of studies have focused doubt on the quality and cost effectiveness of direct end-user searches when compared to those mediated by experienced professionals. [9,13,17] However, the thesis continues to prevail that end-users should and need to take over database searching themselves supported by the unwavering encouragement and exhortation of librarians and/or information professionals.

Digressing for a moment to briefly examine the profusion of literature that exists on the studies of end-users and database searching, the vast majority are seen to deal with online searching. Needless to stress, the technology of laserdisk access to data files is comparatively young and very few studies prior to 1985 may be identified. Examination of the literature to the present identifies less than three dozen items published on direct enduser searching in CD-ROM databases.These were comprised of five items relating to enduser instruction for WILSONDISC, Compact Cambridge MEDLINE, PSYCLIT on Silverplatter, and ERIC, PSYCLIT and AGRICOLA--also on Silverplatter.[1,6,10]

One study dealt with then current CD-ROM database listings, and two with electronic publishing.[5,23] Many of the papers focused on prospects for future uses of CD-ROM technology (7 items) [2], and an equal number encompassed CD-ROM installation and use studies for a variety of different producers.[3] Three pieces of research did dwell on CD-ROM systems descriptions in libraries [1,8,25], and two directed toward catalogs on disk or cataloging per se [4].

One article described the acquisition and mounting of a number of CD-ROM databases on a Hewlett-Packard mainframe at Shanghai Jiao Tong University in China, beginning in 1987 [19]. This was also incorporated in one of two monographs published in 1988, as the proceedings of an international symposium held in the People's Republic of China. [30] The other monograph sponsored by the American Library Association focuses on services and providers only, for end-user searching--however, not only of CD-ROM but all database search systems. [18]

In the final count, five studies remain that researched end-user related factors as of this writing. [6,8,28,31] These latter papers reached conclusions such as the perceived or actual increase in number of CD-ROM end-users, the long lengths of time taken by menu mode searchers, cumbersome and inconvenient command languages of some products, and the overwhelming success of other products. It is notable that no studies have hitherto researched and/or discussed direct end-user searching of CD-ROM databases, specifically adverting to comparisons of menu mode and command mode searching characteristics.

INTRODUCTION

Direct end-user searching was affected by the arrival of databases on CD-ROM disks gradually. Libraries, faced with the new CD-ROM technology, initially balked at the high cost of CD-ROMs needed to supplement or replace online searching.

Acceptance of the cost-free (to the user) unlimited searching on compact disks came somewhat slowly, given the initial fanfare heralding the then new technology. [15] Studies at this point in time proliferated on the subject of how to justify acquisition of CD-ROM databases at the prevalent high costs. [15,26] Eventually, institutions discovered that the recurring online searching costs could be converted to fixed, predictable, annual expenditures that have become reduced in direct proportion to actual usage (number of users) and by competition among CD-ROM producers. Thus, it appears that it is solely in the use of CD-ROM databases, that there has been greater acceptance by and involvement of the end-user, [24,26], and an increase in number of users and searching as well. [1]

DIALOG Information Services, Inc. is one of many producers offering the ERIC database as a CD-ROM product--DIALOG-OnDisc ERIC. It has a choice of either a menu driven option for searching or a DIALOG command driven mode for the end-user. The menu driven EASY MENU version presumably relieves the user from learning a burdensome set of commands. Further, it is commonly held that the menu version should be easier to learn and remember--although the command version should provide greater flexibility and enable the end-user to avail him/herself of the more complete use of the power of the natural DIALOG command system.

In view of all this, it may be expected that novice end-users would be more successful with the menu mode than with the command mode of searching. Expert searchers or intermediaries may be successful to a greater or lesser degree than either of these aforementioned groups--depending on whether subject expertise or system expertise is the prevailing criterion for judging retrieval.

With this as backdrop, it may be stated that the present study was not designed to explore the quality, utility, or performance of ERIC on DIALOG-OnDisc--which has been recorded already, many times over. [11,20,22,24] It is, however, intended to focus on the utility of menu systems in comparison with command driven search modes because of the paucity of studies examining into end-user employment of different search modes.

The present paper also deals with a unique situation for a population with similarly unique characteristics. The study reported was <u>not</u> set up with subjects recruited or chosen. The

participants fell naturally into their respective groups by virtue of the manner in which they enrolled to pursue a masters in education degree. They were mandated to set up a research project for their theses--searching the literature of education as encompassed by the ERIC database and employing a mode of their choice to search; or having an intermediary perform their searches for them. Further, the study reported here did not use a regimen structured to teach and train subjects for continuing CD-ROM searching in the future. It was rather in the nature of instructing and training a set of subjects to attain their respective goals by completing a search assignment, with no further obligation to engage in bibliographic searching in the future.

STUDY BACKGROUND

To recapitulate the scenario leading to the inception of the present study, it is pertinent to describe the following events. Back in 1985, when online database searching became freely available at CSI Library, the Department of Education at CSI mandated that all masters in education students have literature searches performed online for them for their major term papers (initial semester) and/or theses research (final semester).

These searches were done by an experienced intermediary. Database searching was offered free to faculty and graduate students of CSI, and the costs were underwritten by the Library until the Fall of 1986, when the College Administration determined that database searching should no longer be free, but henceforth be charged at cost. In the meantime, the first semester Fall 1985 installed "pilot program" for education masters students having been acclaimed a resounding success, the second semester of operation saw the training of two Education Department faculty members by DIALOG, as well as by the present author--to cope with the increasing number of searches for students.

The elimination of cost-free searches resulted in students having to pay for their thesis research searches. A variety of strategies were employed to deal with this. Foremost among them were the acquisition and use of a faster (2400 baud) modem, and the downloading of searches to disk instead of printing online or offline via the producer. As a result, costs of online searches charged to students were kept to an average of $6 - $8 per search on DIALOG.

Further reductions were made possible by using BRS as a service. Since CSI, in common with innumerable institutions across the nation are OCLC members, the college has access to deeply discounted group rates using consortia such as the Michigan Library Consortium via the State University of New York. CSI was able to obtain a very low BRS rate per connect hour across the board for the volume of searching that CSI

anticipated per year from prior statistics. This translated to ERIC database searches on BRS for about half the cost of DIALOG searches. [15] Students certainly did not grudge paying these rates, or even the somewhat higher DIALOG charges. The present author exclusively used ERIC on BRS while the faculty members performing searches for students restricted themselves to DIALOG as a service.

To further enhance the lowering of per search costs to a minimum, masters in education students were required to perform a manual search in the printed ERIC indexes, and provide at least one targeted citation relevant to their topic. Additionally, they were required to provide ERIC descriptors that they had used in conducting their manual search--entering the same appropriately on a standard search request form that they had to submit. (See APPENDIXES)

Classes of these students had instruction given them on the nature and use of the controlled vocabulary of ERIC via the Thesaurus of ERIC Descriptors--during their regular scheduled classes by Education Department faculty. In addition, each class was instructed by the present author or another Librarian at CSI in the mechanics of having an online search performed for them. In the initial classes given by Education Faculty, instruction on how to do research in the field of education using the ERIC database entailed demonstrating to the students the techniques of dividing their search topics into valid concepts and translating them into terms or descriptors from the ERIC Thesaurus. They were further instructed on manipulating the selected terms logically, before going to the electronic search process, or using them in the printed indexes.

It may be emphasized that a good knowledge of the needs of end-users means good precision or relevance in searches. This was exactly what Faculty already were aware of and tailored their instruction to. In the later classes given by Librarians, database structure and indexing practices were taught for simple searching--this being very much essential in a database such as ERIC, whether for searching online or for use in CD-ROM versions. Simple search formulation, logical and adjacency operators, basic searching and printing commands, and the value of displaying and browsing output were demonstrated. Thus, the concepts and database characteristics taught by Faculty and Librarians were meant to ensure quality searching parameters--whether manual or computer assisted.

Online search intermediaries would, when students were ready to have searches performed for them, conduct a quick reference interview to check descriptors etc., and schedule search appointments for each student. Searches were then performed with the student present so that the user had the opportunity to interact as the search progressed.

This now full-fledged program settled into full operation and progressed apace and unabated until the Fall of 1988. At this point, the CSI Library finally brought to fruition the installation of ERIC on DIALOG-OnDisc. At the inception, only the "current" disk was in place covering the time period 1980 through September 1988. It certainly became a fitting adjunct to the regular fee-based search service for masters in education students at CSI.

DIALOG-OnDisc was selected by CSI from among the several CD-ROM products currently available because of the characteristics and nature of the product--which have been well recorded in the literature. An important consideration in the choice was the availability of access to DIALOG online via DIALOGLINK as software. This constituted an overwhelming advantage over other CD-ROM services as far as CSI was concerned. No other producer, for the ERIC database, has this option available currently.

The Department of Education hailed the new era of ERIC on CD-ROM and cost-free searching for educational research materials available in the past only online, and called it a redletter day when the first workstation was installed. While Education faculty were enthused to an nth degree, students who commenced using ERIC on CD-ROM were even more elated--that they had in a short time a printout of bibliographic references in their hands relating to a search which they had themselves performed!
Education faculty had initially projected the use of ERIC on CD-ROM for the Spring semester of 1989--presumably after faculty had mastered the system. However, the student users simply would not be denied. They provided the greatest response and reception to the CD-ROM database of ERIC. It is their searching and feedback that provided the background and support for the results that are detailed in this study.

TREATMENTS

Graduate education students at CSI fall into several groups, in at least four classes per semester. In the first semester of their masters program they had instruction in the basics of educational research, and in their second semester of study were instructed in the mechanics of adapting their manual searches in preparation for online searching, as has been outlined in the background to the study.

The arrival of CD-ROM version of ERIC changed the situation somewhat. Since entirely new instruction was necessary to begin searching on DIALOG-OnDisc, the second semester classes were reorganized to reflect the students' access to the new technology. Instruction was based on the EASY MENU search material in the DIALOG-OnDisc Manual, supplemented by actual concrete search examples illustrated with printouts of menu

screens and windows. Each student, in addition to having the classroom instruction, had hands-on time at a CD-ROM workstation, with a copy of the handout provided to be used beside the workstation. Also provided were copies of the Thesaurus of ERIC Descriptors. Since only the current ERIC CD-ROM disk was available until the Spring of 1989, some students needed to have a search done online to cover the archival period, 1966-1979. Others may not have wished to tangle with the new technology, or plainly preferred not to search themselves, or decided they really had time constraints--especially employed students taking evening and/or weekend classes.

Accordingly, for the purposes of the study that is reported, students requiring or doing an ERIC search fell into three groups, viz. (i) students in the end-user group using the EASY MENU mode of searching; (ii) students in the end-user group using the DIALOG command mode for searching ERIC on DIALOG-OnDisc; and, (iii) students wishing an intermediary do an online search of ERIC for them. For the purposes of and during the period encompassed by this study, there were 49 students from four classes who participated. There were 20 students who requested online searches for their research, 18 students who searched their topics the EASY MENU way on DIALOG-OnDisc, and 11 students who eventually used the DIALOG command mode to perform their searches.

For students using the CD-ROM workstation, assistance was at hand in the way of a librarian or faculty member from the Department of Education. Students were, however, allowed to use the workstation uninterrupted until they completed their searches and arrived at retrievals judged relevant for them and by them. This was done to monitor the effects of instruction they had been given, and to evaluate the interaction between the students and the system they worked with.

The 18 students who used the menu mode to complete their searches used the ERIC descriptors that they had preselected and had used previously in their manual searches. ERIC descriptors were oftentimes supplemented by words and phrases especially if output was expected to be little, in light of their experiences with their manual search results. They proceeded stepwise through menu screens, selecting, modifying, adding, deleting, and limiting from screens that displayed numbers of records. They displayed retrievals from which they printed out for their use selected items that they judged were relevant to their needs. Almost invariably they printed out citations with abstracts or annotations.

A simple questionnaire was completed by each student at the end of their search processes to provide their experiences with the search process, the retrieval number and quality, and their overall satisfaction or otherwise with the searches and results

obtained by them. The questionnaire format is seen in the APPENDIXES.

TABLE 1 sets out the search topics and information on retrievals, times, and comments by the endusers. The 18 endusers who collectively formed this group of EASY MENU searchers had concerns about the amount of time that had to be spent in negotiating the menu screens in order to complete their searches.

The commonest complaint was about the use of the function key (F10) in order to save a set or sets of records retrieved, before using one or more other screens stepwise in order to modify, qualify, limit, delete, and the like, and bring a search to a logical conclusion. Faculty members of the Department who were routinely monitoring the endusers reported the latter mentioned problem. This was confirmed by the student responses. Another common frustration was the appearance of an asterisk mark preceding a word or search term, when searching, (*). Endusers were seen repeatedly pressing the enter key (or return key) and mistakenly gathering together lists of words and terms--which they did not desire to add to their retrieval of records.

There was also some concern about the function key (F2) which endusers had available to them in the easy menu mode whenever a descriptor had related terms in the Thesaurus. These oftentimes entailed a more cumbersome search strategy because of the multiplicity of the terms selected--not necessarily resulting in a precise search.

Some endusers also had trouble in limiting and in the elimination of unwanted concepts. In these, the basic problem was one of having to spend time flipping through menus and screens in a certain order which could not be bypassed. Overall, it was a question of the amount of time the endusers were spending in arriving at their final of relevant retrievals.

It was then quite swiftly realized that the endusers in the EASY MENU mode were being frustrated at the least by the inordinate amounts of time they had to spend in searching. It was time for drastic steps.

The decision was arrived at quite spontaneously to teach the very next class of masters in education students the DIALOG command version of searching. The logic behind this decision was irrefutable: all students had basic instruction in all of the necessary aspects for searching ERIC, and had performed searches in the printed indexes in readiness for the electronic version. They had their concepts for their search topics translated into descriptors which they had already tested out in their manual search. What more did they need to utilize the DIALOG command search mode than just the basics of simple search formulation, logical and adjacency operators, and the basic searching and

printing out commands! (The APPENDIXES include a two-page instruction sheet, which is intended as a quick reference refresher to command searching, placed at the workstation.)

Accordingly, a "new" group of students underwent training in the DIALOG command searching basics, with simple explanations of Boolean logic in supplement. Instruction was reinforced by illustrative handouts of actual search samples. Students were also notified at this point that they were still free to opt for either method of searching available to them for ERIC on DIALOG OnDisc. It was also explained to them very clearly that previous students had been encountering certain frustrations about time concerns and efforts at grappling with certain search mechanisms in the menu driven mode. They were encouraged to use the command driven version that had just been taught them.

The results of the searches performed by this group of students numbering 11 were little short of spectacular--and are seen in TABLE 2. The application of the simple basics of DIALOG command searching they had been instructed in appeared to have worked more than just satisfactorily. The search parameters were no more complicated in any of the 11 searches performed than the appropriate use of "and" "or" and "not" logic. They had been instructed in using simple search steps, instead of stringing their concepts as statements involving nested logic. In cases where limiting of retrievals was desired or necessitated, assistance by way of a librarian was available, just as much as for the menu driven mode searchers.

Search times recorded in TABLE 2 did not include time expended in displaying, selecting items, and printing desired retrievals with the usual annotations/abstracts. Actual search times recorded in all cases are seen not to have exceeded some few minutes in real time. Comments, remarks, and level of satisfaction measured by a questionnaire are denoted in TABLE 2.

The end result of the activities and direct experiences of this command search group supported what began as a surmise or conjecture for this population of endusers. Students thus instructed in searching ERIC on DIALOG-OnDisc would appear to be benefited to a greater degree if they opted to use the command search mode.

Students using the command mode spent less time searching and retrieving results selected from total output. They faced far less frustrations dealing with the manner in which actual searching progressed. They were in a position to avail themselves of the speed of DIALOG command searching. And, of course, they had less problems overall, as is evident from the tabulated material. (See TABLES 1-2)

Contrariwise, in the menu search mode, the succession of menus

that had to be negotiated had those students slowed down, even if they used the precise ERIC descriptors that they had already utilized in the printed indexes. Notably, some seemingly straightforward 4 to 5 descriptor searches had menu mode searchers tied up in periods of up to two and one-half hours. This is seen in TABLE 1.

The third group of masters in education students comprised a population for whom online searches were performed by an experienced intermediary--becoming an involuntary control group for the present study. From the selfsame classes that were instructed in searching ERIC on DIALOG-OnDisc came these students; they had necessarily proceeded through the formalities of first semester and second semester classes of instruction.

However, these were students that did not wish to perform their own searching because: they were aware that they could search via an intermediary; or, they claimed they had time constraints; or, they desired to have an online search done covering the entire ERIC database, 1966-to date, to the current week. In all of the above instances, the students in question did in no way mind the charges for an online search. This type of user behavior has been recorded, and even as very recently as in a 1989 study. [3] The students were also perfectly aware that searches performed for them online would be done at the least possible cost by the CSI Library--not only because the ERIC database is relatively inexpensive to search, but also because CSI uses every possible means to ensure least cost to the user.

It is noteworthy in this connection, that as has been recorded often in the literature [1], online searching fell for the ERIC database at CSI, too, at the introduction of the CD-ROM version of ERIC. However, usage of the online equivalent still continued to remain high--because of student demands for up-to-the-current-week online information, and the like.

TABLE 3 sets out the results of online searches performed for the 20 students who opted to have mediated searches.The total times noted in TABLE 3 for searches included brief presearch interviews before going online as well as the offline printing times of downloaded retrievals selected. The actual search times recorded included time spent, if any, by the user interacting with the search screen while the intermediary was online, as well as the time spent online downloading desired retrievals to be later printed out offline--as these time counts could not be realistically separated and taken while online. The amount of retrieval or output (in terms of number) in many of the cases in TABLE 3 was low because of student requests for limitation to recent citations, or precision desired, or actual paucity of material on the topics searched, or limitation desired by some other criterion.

DISCUSSION

Encompassing the results reported in the study coupled with the experiences that end-users underwent as shown by their responses, this study demonstrates that end-users can perform their own searching to different degrees of effectiveness, using the menu driven or command driven versions of ERIC on DIALOG-OnDisc. Comparable findings have been reported in one of the few CD-ROM enduser studies. [28] In the latter study, a general conclusion was reached that patrons were able to use CD-ROM ERIC to their advantage and were helped by instruction. In the present study, regardless of the instruction and the subsequent mode of searching adopted, retrieval deemed satisfactory by the end-user (in comparison with mediated searching) resulted.

TABLE 4 summarizes the overall measures of satisfaction recorded by questionnaire, for all three modes of searching. EASY MENU mode end-users were seen prone to more miscues, whereas command driven mode end-users made fewer errors during searching (TABLES 1-3). While these differences admittedly did not result in clearcut differences in retrieval quality, it is quite clear that the command mode end-users realized greater satisfaction at the least in terms of faster retrieval time.

In preliminary findings for a paper on teaching DIALOG-OnDisc [16], it did appear that menu mode searching by end-users was on par with command mode searching in regard to retrieval in general. For purposes of comparison in the contexts in that paper, that view was valid. However, on examination of the actual numbers of citations retrieved, from which the menu mode end-users selected items relevant for their use, the conclusion arrived at here is different. Menu mode searches did result in significantly larger actual retrievals. So that, the relevance figures for retrievals were seen to be equally significantly lower, and the number of citations used also smaller. (See TABLE 4)

As mentioned before, the menu mode of searching is commonly held easier to learn and remember, and consequently searchers should be more successful with this mode. Neither of these two beliefs are supported by this study. It has to be reiterated right at this point that these beliefs were in reference to online database searching only and should have no validity for extrapolation to CD-ROM database enduser searching--as was pointed out earlier.

In point of fact, the only two papers to have surfaced recently [6] had curiously different conclusions for command language searching of the same database, MEDLINE, on the same producer software--Compact Cambridge. The University of Vermont Dana Medical Library study explored the limitations of, ease of use and user satisfaction with the software, and found that endusers

spent time mastering what was considered a cumbersome and inconvenient command language. On the other hand, the State University of New York at Syracuse, Health Center Library found their usage study pointing to an overwhelming success, judged by both the high usage and the increased user understanding of MEDLINE as well as MeSH indexing! It has to be borne in mind that Compact Cambridge MEDLINE has only one available mode of searching--command language.

In fairness to the menu driven mode of searching, it must be stated that the CSI experience does not imply that the DIALOG EASY MENU version or any other menu driven mode is especially difficult to learn or use. Evidence to the contrary has been recorded many times. [11,20,22,24]

It is evident that the conclusions arrived at in the present context applied in a unique manner to a special population of end-users who had instruction in research methodology, focused teaching in searching, and training to follow through. These may not be possible entirely with larger groups of more general users, and remain to be seen in future studies. The dramatic turn of events described in this study led to that serendipitous decision to initiate command mode searching. This was the one step that pointed to the conception of this study in conjunction with the real lack of enduser oriented research--and also the one revolutionary step for CSI programs for the future.

One more significant factor that emerged was that user judgments and the mediated searchers' judgments were oftentimes different in regard to citations identified as relevant. However, end-users were noted as very much inclined to be satisfied with the searches done for them by intermediaries. Comments in TABLES 1-3 demonstrate the importance of user judgments in determining the final value of searches.

From the results tabled, menu mode end-users are seen to have spent longer periods of time devoted to the actual search mechanics, as well as more time refining and/or limiting retrievals to arrive at the level of relevance they desired. The question of time spent in searching has been written upon often. In a 1988 paper on the search performance of endusers, it was reported that end-users spent over twice as much time as intermediaries to perform searches, although no significant differences were found either in precision or recall. However, again, the focus was purely on online searching. [30]

Once their final retrievals were obtained, the general satisfaction of endusers in the present study was seen to be no smaller or larger than for the other two avenues of searching used. This does parallel the precision and recall findings in the above-mentioned paper. [30] End-user frustrations are recorded as being with the time spent, search mechanics, and ease

of searching, and not with the final results that they received.

The present study appears to establish, at least for the type of end-user in question, that the menu mode search software utilized by producers need to be rewritten or modified to enable end-users to steer clear of or negate the kinds of problems encountered in this study.

These difficulties are met with to a greater or lesser extent in the software of most producers, thus far in use. [6,22,24] Sufficient stress could never be placed on this aspect of software user friendliness. Software changes being predicated by costs to the producer, it is no wonder that producers are leary of too swift changes to their search software, if at all changes are acceptable!

In any event, in contexts similar to those detailed in this study, it is clear that the command mode of searching, wherever available as an alternate, will continue to hold significant advantages over the menu mode.

To proceed a step further, producers with software capable of command modes of searching, in addition to or as an alternative to menu searching provided in their package, should no doubt come to have significant advantages over others that do not have this capability. An exception to this, obviously, would be those producers whose software is only command driven--such as Compact Cambridge. The conflicting reports about the latter software have already been noted earlier and seem to be quite an anomaly. [6]

It must also be once more emphasized that all studies have, hitherto, been focused on comparisons of menu driven and command driven modes of searching by end-users in searching online only--and not on CD-ROM--to reach those general beliefs and/or conclusions relating to success and ease of searching or learning searching. This aspect has been dealt with in detail earlier. Suffice it to state that the assumption has been that-- what applies to online applies to CD-ROM usage as well.

The results of the present study, however, indicate that entirely different findings would emerge from teaching command searching to end-users of CD-ROM versions--even perhaps at a generalized level. Again, this remains to be seen in future studies looking into the latter aspect. The possibility of CSI proceeding in this direction looms large with recent database acquisitions as is noted below.

Accordingly, it is worth recording that, based on the eminent success of the program which generated the present study, a parallel program using the same design as the education graduate students program was instituted at CSI for computer science seniors. The databases being used are the Microcomputer Index,

INSPEC, and COMPENDEX. Needless to state, this program has been equally successful in implementation, and CSI looks forward to the future acquisition of COMPENDEX PLUS on CD-ROM via DIALOG-OnDisc, and of INSPEC on CD-ROM to replicate the present study.

In a related development, CSI has, as of the Fall semester of 1989, acquired MEDLINE on DIALOG-OnDisc (disks from 1984 to date), and has installed the CD-ROM database primarily for the use of students in the four year Nursing program--paralleling the education and computer science experiments proved successful. This program is presently being evaluated for replication of the present study.

REFERENCES

[1] Anders, Vicky and Jackson, Kathy M. "Online vs. CD-ROM: the Impact of CD-ROM Databases Upon a Large Online Searching Program." ONLINE, 12 (6) 24-32, November 1988.

[2] Bartenbach, Bill. "Impact of Optical Disc Publishing on the Information Community." INSPEL, 20 (4) 205-220, 1986; Bartenbach, Bill. "CD-ROM and Libraries." Proceedings of the 8th National Online Meeting, New York, May 5-7, 1987, p.9-19; Bovey, J.D. and Brown, P.J. "Interactive Document Display." JOURNAL OF DOCUMENTATION, 43 (2) 125-137, June 1987; Micco, Mary and Smith, Irma. "Designing an Integrated System of Databases." LIBRARY SOFTWARE REVIEW, 6 (5) 259-262, 1987; Nicholas, D., et al. "End-users in Higher Education: the British Experience." BRITISH JOURNAL OF ACADEMIC LIBRARIANSHIP, 2 (2) 105-26, Summer 1987; "Our Brightest 21st Century is Coming." (Japanese) JOHO NO KAGAKU TO GIJUTSU, 37 (1) 4-20, January 1987; St. Jacques, Suzanne. "End-user Searching for a Large Clientele at the University of Ottawa." CANADIAN JOURNAL OF INFORMATION SCIENCE, 11 (3/4) 122-30, 1986.

[3] Bezanson, Deborah. "Integrating CD-ROM With Printed and Online Services." OPTICAL INFORMATION SERVICES, 7 (6) 387-90, November-December, 1987; Buckholz, James L. "Implementing and Evaluating a Bibliographic Retrieval System for Print and Non-Print Media Materials." Doctor of Arts major project, Nova University, Fla., 1987, 185p.; Harter, Stephen F. and Jackson, Susan M. "Optical Disk Systems in Libraries." RQ, 27 (4) 516-27, Summer 1987; Kleiner, Jane P. "Info Trac: an Evaluation of System Use and Potential Use in Libraries." RQ, 27 (2) 252-63, Winter 1987; Monical, Ruth and Rible, Jim. :ERIC on CD: Southern Style." OCLC MICRO, 4 (3) 18-22, June 1988; Tseng, Sally C. and Boyer, Calvin J. "CD-ROM Compact Disc Read-Only Memory." In: International Symposium on New Technology and Applications in Libraries; Shanghai, Jiao Tong University Press, 1988, p.59-64; Tucker, Sandra L. et al. "How to Manage an Extensive Laserdisk Installation: the Texas A & M Experience." ONLINE, 12 (3) 34-45, May 1988.

[4] Buckholz, James L. "Implementing and Evaluating a Bibliographic Retrieval System for Print and Non-Print Media Materials." Doctor of Arts major project, Nova University, Fla., 1987, 185p.; Burr, Robert L. "The Electronic Branch Library: Using CD-ROM and Online Services to Support Off-Campus Instructional Programs." Proceedings of the 9th National Online Meeting, New York, May 10-12, 1988, p.37-41.

[5] Calabreese, Andrew M. "The Electronic Journal." Paper Presented at the Central States Speech Association, Cincinnati, OH, April 17-19, 1986, 35p.; Rice, Mitchell. "Toward Enhancing the Social Benefits of Electronic Publishing." Aspen Institute for Humanistic Studies, New York, 1987, 22p.

[6] Capodagli, James L. et al. "MEDLINE on Compact Disc: End-user Searching on Compact Cambridge." BULLETIN OF THE MEDICAL LIBRARY ASSOCIATION, 76 (2) 181-83, April 1988; Lee, Donna. "End-user Access to MEDLINE: the Role of CD-ROM." Proceedings of 9th National Online Meeting, New York, May 10-12, 1988, p.199-204.

[7] Caruso, Elaine. "Computer Aids to Learning Online Retrieval." Annual Review of Information Science and Technology, v.16, p.317-35, 1981.

[8] Cornick, Donna. "Being an End-user is not for Everyone." ONLINE, 13 (2) 49-54, March 1989.

[9] Des Chenes, Dorice. "Online Searching by End-users." RQ, 25 (1) 89-95, Fall 1985.

[10] Dow, Victoria E. and Kriebal, Gail. "Wilsondisc: Training the Trainer." Proceedings of the 9th National Online Meeting, New York, May 10-12, 1988, p.71-78; LaBorie, Tim. "Vending End-user Searching in a University Library." Online '87: Proceedings of the Conference, Anaheim, Ca., October 20-22, 1987, Part 1, p.132-135; Lee, Donna. "End-user Access to MEDLINE: the Role of CD-ROM." Proceedings of the 9th National Online Meeting, New York, May 10-12, 1988, p.199-204.

[11] Duggan, Mary Kay. "A Look at DIALOG's First CD-ROM Product." OPTICAL INFORMATION SYSTEMS, 7 (5) 401-405, Nov-Dec. 1987.

[12] Fayen, Emily Gallup. "The Answer Machine and Direct Connect: Do-It-Yourself Searching in Libraries." ONLINE, 12 (5) 13-27, September 1988.

[13] Fenichel, Carol H. "Online Information Retrieval: Identification of Measures That Discriminate Among Users With Different Levels oand Types of Experience." Ph.D. Dissertation, Drexel University, Pa., 1979.

[14] Halperin, Michael and Renfro, Patricia. "Online Versus CD-ROM Versus Onsite: High Volume Searching--Considering the Alternatives." ONLINE, 12 (6) 36-42, November 1988.

[15] Jayatilleke, Raja. "CD-ROM: Implications of the Emerging Technology for Academic Information Services." Optical Publishing & Storage: Products That Work. Proceedings of Optical Publishing & Storage '87, New York, November 11-13, 1987, p.93-101.

[16] Jayatilleke, Raja. "Teaching Searching DIALOG-OnDisc ERIC to Graduate Education Students." Proceedings of the 16th Annual DIALOG Update Users Conference, St. Louis, Mo., September 26-28, 1989, p.3:89-3:102.

[17] Kehoe, Cynthia A. "Interfaces and Expert Systems for Online Retrieval." ONLINE Review, 9, 489-505, 1985.

[18] Kesselman, Martin and Watstein, Sarah B., Editors. "End-user Searching: Services and Providers." Chicago, American Library Association, 1988, 230p.

[19] Lin, Sharon Chien. "Shanghai Jiao Tong University Pao Sui-Loong Library: Toward an Integrated Online System." INFORMATION TECHNOLOGY AND LIBRARIES, 8 (1) 63-68, March 1989.

[20] McLaughlin, Pamela W. "New Access Points to ERIC: CD-ROM Versions." EDUCATION LIBRARIES, 12 (3) 73-76, February 1987.

[21] Meadow, Charles T. "Online Searching and Computer Programming: Some Behavioral Similarities." ONLINE, 3 (1) 49-52, March 1979.

[22] Olsen, Lucie. "Experiencing CD-ROM ERIC." EDUCATION LIBRARIES, 12 (3) 77-80, February 1987.

[23] Peters, Charles. "Databases on CD-ROM." ELECTRONIC LIBRARY, 5 (3) 154-60, June 1987.

[24] Reese, Jean and Steffey, Ramona. "ERIC on CD-ROM: A Comparison of DIALOG OnDisc, OCLC's CD450, and Silverplatter." ONLINE, 11 (5) 42-54, September 1987.

[25] Silver, Howard. "Managing a CD-ROM Installation...A Case Study at Hahnemann University. ONLINE, 12 (2) 61-66, March 1988.

[26] Steffey, Ramona J. "New Issues in Budgeting for Optical Publications." Optical Publishing & Storage: Products That Work. Proceedings of Optical Publishing & Storage '87, New York, November 11-13, 1987, p.165-70.

[27] Stewart, Doug. "Putting Natural Language to Work." POPULAR COMPUTING, 54-68, 123-24, September 1985.

[28] Stewart, Linda and Olsen, Jan. "Compact Disc Databases: Are They Good for Users?" ONLINE, 12 (3) 48-52, May 1988.

[29] Sullivan, Michael V. et al. "Direct Access to Bibliographic Databases by End-users: Menu Facilitation Versus Native Command Language." Palo Alto, Ca., Stanford University Libraries, 1985, 222p. ERIC Document ED 277 388.

[30] Tseng, Sally C. and Boyer, Calvin J. " CD-ROM Compact Disc Read-Only Memory." In: International Symposium on New Technology and Applications in Libraries. Shanghai, Jiao Tong University Press, 1988, p59-64.

[31] Walker, Geraldine. "The Search Performance of End-users." Proceedings of the 9th National Online Meeting, New York, May 10-12, 1988. p.403-430.

The preliminary findings resulting from this study were presented at the 16th Annual DIALOG Update Meeting, St. Louis, Mo., September 26-28, 1989.

Communications to the author should be addressed to Raja Jayatilleke, Database & Sci-Tech Specialist, College of Staten Island of CUNY, 130 Stuyvesant Place, 1-200, Staten Island, New York, 10301-1953; 718/390-7825,7826.

APPENDIX 1

COLLEGE OF STATEN ISLAND LIBRARY

COMPUTER SEARCH SERVICE REQUEST

NAME_____ STATUS _____ OFFICE _____

SS#_____ PHONE_____

TOPIC/TITLE _____

_____

_____

PURPOSE: _____

Number of citations desired: _____ Abstracts wanted? YES _____ NO _____

LIST OF TERMS (INCLUDING AUTHORS) _____

_____

ADDITIONAL INFORMATION, OR LIMITS _____

_____

Where have you looked thus far? Indexes used? _____

_____

CHARGES ARE BASED ON A COMBINATION OF SEARCH TIME AND CITATIONS

COST:_____ PAYMENT:_____

DATABASES SEARCHED _____

Date of interview_____ Date of search _____

Searcher/Interviewer _____

SEARCHER: Offline preparation time:_____ TOTAL_____

Online time: _____ TOTAL_____

Offline completion time:_____ TOTAL_____

TOTAL TIME _____

HOW TO SEARCH DIALOG-ONDISC ERIC

USING THE COMMAND MODE

STRATEGY

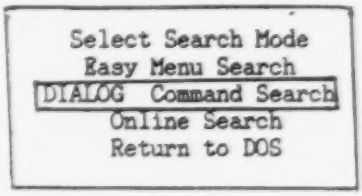
To construct your strategy, you would proceed to divide your search topic or inquiry into the concepts that comprise it and find suitable descriptors or terms for those concepts in the THESAURUS OF ERIC DESCRIPTORS. For instance, if you are looking for information on the LEARNING PROBLEMS and LEARNING READINESS associated with MAINSTREAMING in children, you would select three concepts shown above in block capitals. Consulting the ERIC THESAURUS, you would come up with the self-same terms as valid descriptors which you may use in searching.

SWITCHING ON THE CD-ROM WORKSTATION

If your workstation is not ON, proceed to switch the units or components that comprise the workstation in the following order: PRINTER, COMPUTER, CD-ROM DRIVE, and MONITOR SCREEN. The international symbols for on and off on the components are: | =ON O =OFF

(A) ON-OFF switch on the PRINTER is colored RED, on its RIGHT-HAND side.
(B) ON-OFF switch for the COMPUTER is colored RED, facing you.
(C) ON-OFF switch for the CD-ROM DRIVE is colored BLACK, at its back, LEFT-HAND side.
(D) ON-OFF switch for the MONITOR SCREEN is colored RED, on its RIGHT-HAND side.

When all units have been switched ON in the above sequence, a MENU SCREEN will automatically present itself. To choose the DIALOG COMMAND VERSION of searching, you will highlight that choice by using the UP (↑) or DOWN (↓) arrow keys at your keyboard as appropriate, and then pressing the ENTER (or RETURN) key. The screen will now present a "?" PROMPT, which is the sign that tells you to enter your search statement.



SEARCHING YOUR TOPIC

The simplest manner in which you would use your chosen descriptors to search is stepwise, one descriptor at a time in three separate search statements. At the "?" PROMPT you will type: "SELECT LEARNING PROBLEMS/DE", at which the computer will come back with a figure for retrieval on that statement. The "/DE" in the statement denotes use of your term or phrase as a descriptor only. This is step 1 or S1.

Similarly, step 2, S2: "SELECT LEARNING READINESS/DE"

and step 3, S3: "SELECT MAINSTREAMING/DE"

Since you need all of the items for LEARNING PROBLEMS and LEARNING READINESS, steps 1 and 2 (S1 and S2), you will now combine the results of those two steps using simple Boolean logic, with the OR operator: "SELECT S1 OR S2", and arrive at a retrieval of S4 (step 4). You now have a result for items on the concepts of Learning Problems and Learning Readiness.

You now need to retrieve from among the items in step 4 (or S4) the citations relating to MAINSTREAMING, which you already performed in step 3 (S3). You will effect this by using steps 3 and 4 (S3 and S4), and using the "AND" operator: "SELECT S3 AND S4" and receiving a result, S5.

DISPLAYING RESULTS ON SCREEN

To display on the monitor screen any or all of your results, you may type in a display statement, as follows:

? D 5 / 5/ 1 or ? D 5 / 3 / 1

depending on whether you need the full format, or just the bibliographic citation.

D= Display COMMAND, numeral after D = step # (STEP 5 or S5), the numeral 5 or 3 between the slashes denoting the full format (5) with abstract or annotation, or the bibliographic citation format (3), the final numeral after the second slash constituting the item of citation number you wish displayed.

PRINTING DISPLAYED OUTPUT

Once you have a citation displayed, you may transfer the screen contents to your PRINTER by pressing the PRINT key on your keyboard. To display the next citation, you may press the ENTER key, and so on--until you are done.

Should you wish to do another search, once you have completed the present, you may continue typing in the descriptors for your new search after the latest "?"PROMPT. The set or step numbers generated would be numbered consecutively after the last, S5. You may combine steps after S5 for your new search as appropriate. Your final completion would lead you to LOGGING OFF, as noted below.

COMPLETING SEARCH AND SWITCHING OFF

When your print and display requirements are completed, you will complete the search process by typing "LOGOFF" at the next ? PROMPT. The original menu screen you started the search process at will display. To switch OFF the system, highlight "RETURN TO DOS" AND PRESS return. The screen will present a "C" PROMPT: C:\DLINK . At this prompt, please switch OFF all components in the REVERSE order you used initially to switch the system on.

APPENDIX 3

COLLEGE OF STATEN ISLAND

LIBRARY

EVALUATION OF A SEARCH

In an effort to ensure that our search services are meeting your needs, we are asking you to let us know if your search results were pertinent to your information needs.

Please review printouts of your search results before answering the following:

Date of search_____ Date of evaluation_____

Name_____ Status_____

Search Topic/Title_____

_____

_____

_____

_____

Did you have a reference interview/discuss your search

with a Librarian?_____

Was a Librarian available to assist you, if necessary, at the time of your search_____

Number of citations you retrieved_____

Number of relevant citations on your topic_____

Fewer than expected_____ About the same as expected_____

More than expected_____ (Check one)

Number of citations you could NOT use_____

General Satisfaction Level: In comparison with your expectations, to what extent did the results you retrieved/received satisfy the information needs that you came with?

Exceeded my expectations_____ Met my expectations_____

Somewhat disappointed me_____ Disappointed me very much_____

COMMENTS_____

_____

_____

_____

_____

THANK YOU!

Please return completed form to the LIBRARY Search Services Office.

TABLE 1 ERIC on DIALOG OnDisc-- MENU Search Mode

Search topic	Time spent searching	# of descriptors/ words used	# of items retrieved	Remarks "*" =problems saving records; (F10)=problems using function key
Age and the development of visual memory in kindergarten children	150 mts.	11	36-- 12 eliminated; 15 selected	Negotiating screens very slow Problems selecting. (F10). Citations good.
Achievement of students who do homework vs. those who do not	150 mts.	6	160-- 16 selected by limiting / grade 10	Menus slow. Limiting problems. "*". (F10). Selected most recent 16 items.
Effects of oral and silent reading on student comprehension	100 mts.	7	154 -- 11 selected by limiting	Windows frustrating. "*". Function keys cumbersome. Documents, articles excellent
Effect of direct instruction on listening & reading comprehension of first graders	50 mts.	4	79 -- 67 maj.-- recent 20 selected	Too many menu steps. (F10). Most recent 20, very good.
Moral development & educational attitudes of beginning teacher education students in religious and parochial schools	90 mts.	15	6	Menus confusing when large number of terms need be used. Retrieval small but precise.
Relationships between parental involvement and child's school performance	60 mts.	9	144 -- limited to 16 maj.	"*" annoying. Very slow negotiating way through search when modifying. Used 16 items.
Teacher attitudes toward mainstreamed children vs. special education teacher attitudes toward same group	120 mts.	7	326 -- (198+117)-- 10 eds + 10 ejs selected	(F10). Ten most recent items selected from among articles & documents, good.
Effects of CAI and teacher assisted instruction on arithmetic task achievement scores	75 mts.	18	26 -- limited to 7 selected	Very slow manner of searching when using many descriptors. 7 selected, very useful.
Effects of length of homework assignment on math achievement of third graders	90 mts.	13	46 -- limited to 21 elementary	(F10). Menu screens too proliferative. No items on grade 3, but 21 elementary, good.
Alternative methods to traditional methods of teaching spelling	50 mts.	8	199 -- limited to 18 selected	Wasted too much time in the menu manipulation , for such large retrieval. Selected 18 recent good articles.

ERIC on DIALOG OnDisc-- MENU Search Mode

Search topic	Time spent searching	# of descriptors/ words used	# of items retrieved	Remarks
Manipulatives and math ability of learning disabled students	120 mts.	9	20	Spent 2 hrs. in the alphabetical word lists of words and descriptors. "*". 20 items useful.
Do better readers make better writers	60 mts.	9	447 -- most recent 21 selected	Very slow progress searching. Large number in output limited to most recent 21. (F10).
Textbook instruction vs. role playing--effects on social studies achievement of 4th graders	120 mts.	9	5	Difficult to search quickly because of the number of menu screens to follow. Excellent five items.
Concepts of time are learned better thro' hands-on activities than thro' teacher directed lessons	120 mts.	14	13	Awfully slow in my opinion to go thro' search steps logically, for the number of terms used. (F10).
Effects of CAI on writing skills	60 mts.	7	172 -- limited to maj. 45 -- 7 items selected	Large number of items found limited to major citations. 7 excellent items by limiting.
Effect of review on math achievement of sixth graders	80 mts.	11	6	Very specific returns, but exceedingly slow finishing search.
IBM writing-to-read program and its effect on childrens writing and reading achievement	60 mts.	12	27	Descriptors & words take inordinate amounts of time to gather together in search. Items retrieved acceptable.
Preservice teacher education and educational technology	60 mts.	5	41 -- limited to 12 maj.	"*". Output had to be limited to those citations with the major emphasis.

TABLE 2 ERIC on DIALOG OnDisc-- COMMAND Search Mode

Search topic	Time spent searching	# of words/descriptors used	# of items retrieved	Remarks
Teacher job satisfaction in private & public schools after working 5 or more years	15 mts.	7	35 -- 25 public, 10 private	Excellent general citations, although no specific items re: length of time worked.
Effects of cognitive behavior therapy workshops on level of self esteem of lesbians	20 mts.	8	4	Four acceptable citations. Confirms manual search, and supplements.
Regular kindergarten teachers' developmental task expectations vs. special education teachers' expectations	25 mts.	13	9	Five items regular education, and four items special education teacher attitudes. No citations comparing the two. Good articles, though.
Parental attitudes of children who are severely handicapped vs. those of children who are mildly handicapped--relating to their children's education	12 mts.	7	18	11 items on severely retarded and ten items on mildly retarded; inclusive of 3 fine comparative studies.
Ability grouping at elementary school level--Kindergarten thro' grade 7	10 mts.	6	36	Very useful studies; 18 articles and documents comprising the 36.
Corporal punishment in special education classes	10 mts.	6	15	Most of the items retrieved were Civil Rights cases and reports; only four articles. All good and usable.
Effect of coping skills workshop on level of school attitudes of adolescents	15 mts.	9	15	23 items were eliminated as they were learning disabled or special education documents; acceptable 15, 9 good.
Effect of computers on 4th grade attitudes toward creative writing	20 mts.	5	4	Manual search did not find any; accept the 4 found here.
Sex equity programs/projects in math, science, engineering & technology	5 mts	5	49	16 great citations were found by selecting from the 49--limiting to major studies.

ERIC on DIALOG OnDisc-- COMMAND Search Mode

Search topic	Time spent searching	# of words/descriptors used	# of items retrieved	Remarks
Comprehension among first graders--with and without pictorial clues	20 mts.	5	56	56 items focusing on first graders; 13 pictorial, 42 non-pictorial criteria.
Group homes for the handicapped--parent and state roles in relation to financing inmates	15 mts.	7	87 --8 selected	Of the 87 items, only 8 items were identified relating to a parent role for the finances. Good reports.

TABLE 3

ERIC -- Mediated Online Searches

Search topic	Actual time spent searching	# descriptors used	Cost ($)	Total time	Remarks
Employee assistance programs	6 mts.	7	8.03	16 mts.	Satisfactory citations, 30 of 60--most recent items accepted.
Reading-aloud-to-others and listening comprehension among first graders	6 mts.	3	5.38	11 mts	12 fine articles and documents found.
Pets in the classroom setting	15 mts.	9	8.87	22 mts.	Found very little in my manual search Of 46 found in search, 26 usable.
Emotionally disturbed--age,grade & ability grouping	5 mts.	6	2.41	7 mts.	Five citations found were more than sufficient to support my paper.
Teaching spelling in grade 1	7 mts.	4	4.51	9 mts.	14 good articles and reports.
Montessori vs, regular (KG - 1) grade children's performance	20 mts.	18	8.94	30 mts.	Good collection of 12 relevant items.
Sex education for adolescents	15 mts.	10	7.01	25 mts.	Supplementary items to ones found elsewhere; 13 citations were useful.
Adolescents and alcohol abuse	7 mts.	7	5.61	9 mts.	Eight very good items found for me.
Cognitive behavioral treatment for stress anxiety	8 mts.	4	26.05	21 mts.	Usable--- 22 items--better than printed indexes which produced none.
Whole language approach to reading in Australia, New Zealand, & Canada	8 mts.	4	6.60	12 mts.	Dozen precise and targeted items.
Job satisfaction & years of experience among early childhood teachers	19 mts.	16	11.69	24 mts.	Eight very relevant documents and articles found.
Frequency of testing or frequent testing of special education HS students	9 mts.	6	7.36	13 mts.	Unable to find any in printed indexes. 17 found here for me are good.
Communication skills among kindergarten children with preschool experience	22 mts.	8	13.66	32 mts.	Could not find any useful items in the ERIC indexes. Nine produced here for me are acceptable.

ERIC -- Mediated Online Searches

Search topic	Actual time spent searching	# descriptors used	Cost ($)	Total time	Remarks
Effect of music on selfstimulatory handplay of autistic children	12 mts.	8	7.07	22 mts.	Very glad to have these 18 articles, because I was able to find none.
History of bilingualism in education in the U.S.	20 mts.	5	15.34	27 mts.	33 great citations. I found few but those were in New York Times.
Emotional problems of children in day care centers & latch-key programs	5 mts.	7	13.04	12 mts.	Very little I could find on the subject; these seven articles were fine.
Attitudes of Junior High School special education and regular teachers toward mainstreaming	9 mts.	5	7.49	19 mts.	Found large no. on mainstreaming in ERIC index, but could not track down any for comparative teacher attitudes. These 16 are great.
Will effective learning strategies & encouragement enhance JHS learning disabled students' spelling abilities	7 mts.	8	4.66	17 mts.	Wasted days looking manually. Happy you found at least these 4.
Effect of time-of-day of instruction on math achievement of 8th graders	15 mts.	13	6.71	22 mts.	Realize you could not find many on target; but like these 10 on science education in general.
Effect of interdisciplinary approach in High School on student attitudes	23 mts.	10	10.57	33 mts.	28 citations are pretty good for my topic.

TABLE 4

MEASURES OF USER SATISFACTION

	COMMAND	MENU	MEDIATED ONLINE
General Satisfaction	3.10	3.00	3.50
Retrieval Size	65.00	118.00	68.00
Relevance (%)	56.54	12.66	85.81
References actually used (%)	92.1	46.10	94.40
Expected Retrieval	2.30	1.80	2.40

END

U.S. Dept. of Education

Office of Education
Research and
Improvement (OERI)

ERIC

Date Filmed

March 21,1991